

Code ST02	Project A64-A	Release A	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL SCALE WITH STEEL GRATING - GVS 206 S

GENERAL FEATURES

- Optical scale with stainless steel grating and direct reading of the absolute position. High mechanical resistance and thermal expansion suitable for the application, for a constant accuracy at any temperature.
- High-speed SSI - BiSS C (unidirectional) serial interface.
- Transducer guided by a self-aligned and self-cleaning sliding carriage with spring system.
- No contact reader head. No friction: high duration and tolerance against environmental dirty.
- Resolutions up to 0.1 μm . Accuracy grade up to $\pm 1 \mu\text{m}$.
- Adjustable cable output.
- **SYMMETRIC** mechanical mounting.
- Various possibilities of application, with double-effect joint or steel wire.
- Option: Line Driver digital signal.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL	Cod. GVS	206 S
<ul style="list-style-type: none"> • Rugged and heavy PROFILE, made of anodized aluminum. Dimensions 55x28 mm. • Elastic COUPLING for misalignment compensation and self-correction of mechanical hysteresis. Backlash error <math>< 0.2 \mu\text{m}</math>. • SEALING LIPS for the protection of the grating, made of special elastomer resistant to oil and wearing. Special self-blocking profile. • READER HEAD, consisting of tie rod and reading block, with fully protected place for electronic boards. • CARRIAGE guided by ball bearings with gothic arch profile sliding on tempered and grinded guides, to guarantee the system accuracy and the absence of wearing. • No contact READER HEAD. • Die-cast TIE ROD, with nickel-plating surface treatment. • Absolute stainless steel GRATING. • Elastomeric GASKETS which allow to reproduce the full protection in mechanical joints (in case of disassembling). • Adjustable CABLE output. • Various possibilities of application, with double-effect joint or steel wire. 	Measuring support Grating pitch Linear thermal expansion coefficient	stainless steel grating 204.8 μm  10.6 x 10 ⁻⁶ °C ⁻¹
	Incremental signal (optional)	TTL Line Driver
	Resolution Line Driver	5 μm - 1 μm
	Serial interface	SSI - BiSS C (unidirectional)
	Resolution absolute measure	1 μm - 0.1 μm
	Accuracy grade	$\pm 2,5 \mu\text{m}^*$ standard version $\pm 1 \mu\text{m}^*$ high-accuracy version
	Measuring length ML in mm	170, 220, 270, 320, 370, 420, 470, 520, 570, 620, 720, ... mm max. 6000 mm in modular version
	Max. traversing speed	60 m/min
	Max. acceleration	30 m/s ²
	Required moving force	$\leq 1.5 \text{ N}$
	Vibration resistance (EN 60068-2-6)	100 m/s ² [55 ÷ 2000 Hz]
	Shock resistance (EN 60068-2-27)	150 m/s ² [11 ms]
	Protection class (EN 60529)	IP 54 standard IP 64 pressurized
	Operating temperature	0 °C ÷ 50 °C
	Storage temperature	-20 °C ÷ 80 °C
	Relative humidity	20% ÷ 80% (not condensed)
	Reading block sliding	without contact
	Power supply	5 Vdc $\pm 5\%$ or 10 ÷ 28 Vdc $\pm 5\%$
	Current consumption (with R = 120 Ω)	200 mA _{MAX} 140 mA _{TYP} 5 Vdc 50 mA _{MAX} 30 mA _{TYP} 10 ÷ 28 Vdc
	Max. cable length	20 m **
	Electrical connections	see related table
	Electrical protections	inversion of polarity and short circuits
	Weight	850 g + 1800 g/m

ELECTRICAL

- Reading device with light emitter and receiving photodiodes.
- Option: A and B (digital Line Driver) output signals with phase displacement of 90° (electrical).
- Serial protocol SSI - BiSS C (unidirectional).
- CABLE:
 - Shielded twisted pair for digital signals (SSI - BiSS).
 - PUR cable with low friction coefficient, resistant to oil and suitable for continuous movements.

SERIAL OUTPUT VERSION

- 6-wire shielded cable $\varnothing = 7 \text{ mm}$, PUR external sheath.
- Conductors section: power supply 0.25 mm²; signals 0.25 mm².
- The cable's bending radius should not be lower than 70 mm.**

DIGITAL + SERIAL OUTPUT VERSION

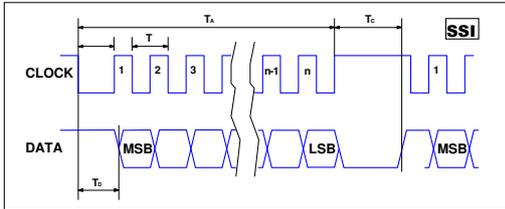
- 10-wire shielded cable $\varnothing = 7.1 \text{ mm}$, PUR external sheath.
- Conductors section: power supply 0.35 mm²; signals 0.10 mm².
- The cable's bending radius should not be lower than 80 mm.**

SIGNALS	CONDUCTOR COLOR
+ V	Brown
0 V	White
CK	Green
$\overline{\text{CK}}$	Yellow
D	Pink
$\overline{\text{D}}$	Grey
SCH	Shield

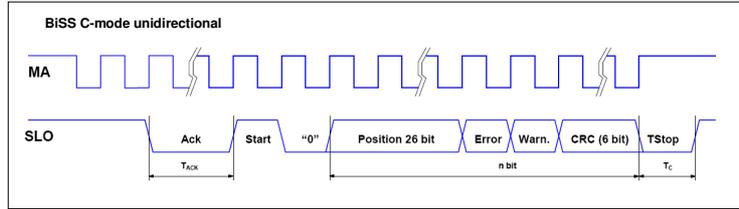
* The declared accuracy grade of $\pm X \mu\text{m}$ is referred to a measuring length of 1 m.
 ** Ensuring the required power supply voltage to the transducer, the maximum cable length can be extended to 50 m.

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OUTPUT SIGNALS

SSI Version


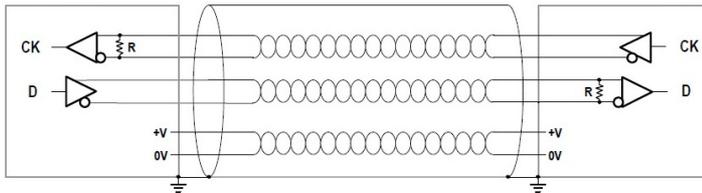
Interface	SSI Binary - Gray
Signals level	EIA RS 422
Clock frequency	0.1 ÷ 1.2 MHz *
n	26 bit
Tc	max. 20 µs
Td	max. 5 µs

BiSS C (unidirectional) Version


Interface	BiSS C unidirectional
Signals level	EIA RS 485 / RS 422
Clock frequency	0.1 ÷ 8 MHz *
n	26 + 2 + 6 bit
Tc	6 µs
Tack	max. 22 µs

* The maximum frequency is guaranteed with a cable length up to 2 m.

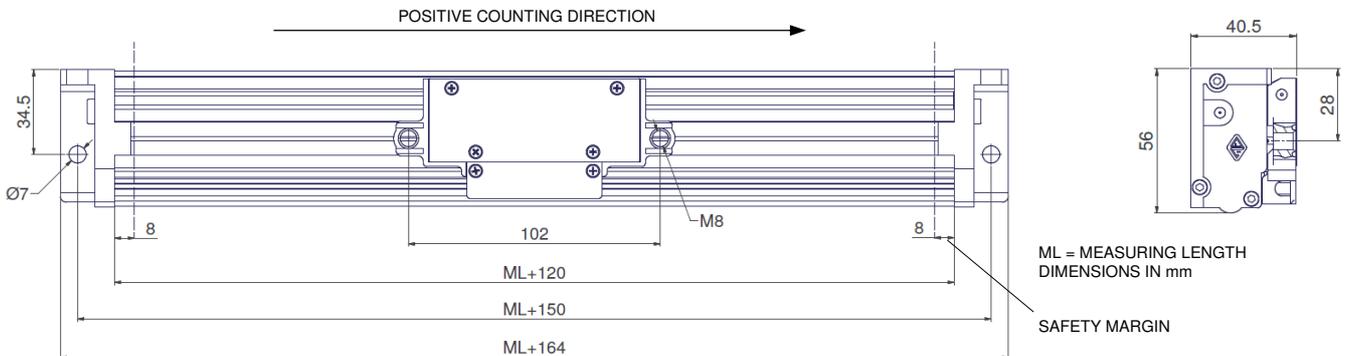
CABLE

Serial output
GVS 206 S


In case of cable extension, it is necessary to guarantee:

- the electrical connection between the body of the connectors and the cables shield;
- the required power supply to the transducer.

DIMENSIONS



GV-PB adapter provided for the interchangeability with scale mod. PBS-HR.

ORDERING CODE

MODEL	RESOLUT.	MEASURING LENGTH	POWER SUPPLY	OUTPUT SIGNALS	INCREMENTAL SIGNAL	CABLE LENGTH, CABLE TYPE	CONNECTOR	SPECIAL, PRESSURIZATION
GVS 206 S	T1	0270	05V	S0	T5	M0.5 / S	SC	PR

T1 = 1 µm Length in mm **05V** = 5 Vdc **S0** = SSI programmable **No cod.** = no incremental signal **Mnn** = length in m
T01 = 0.1 µm **0270** = 270 mm **1028V** = 10 ÷ 28 Vdc **S1** = SSI binary **T5** = Line Driver **M0.5** = 0.5 m (standard)
S2 = SSI binary-even parity **S3** = SSI binary-odd parity **S4** = SSI binary-error **S5** = SSI binary-even parity+error **S6** = SSI binary-odd parity+error **S7** = SSI Gray **B1** = BiSS binary **T1** = Line Driver **S** = 10 wires (serial+digital)
S8 = SSI binary-odd parity **S9** = SSI binary-even parity+error **S10** = SSI binary-odd parity+error **S11** = SSI Gray **S12** = BiSS binary **R** = 6 wires (only serial)
S13 = SSI binary-odd parity **S14** = SSI binary-even parity+error **S15** = SSI binary-odd parity+error **S16** = SSI Gray **S17** = BiSS binary **S** = 10 wires (serial+digital)

Example **ABSOLUTE OPTICAL SCALE GVS 206 S T1 0270 05V S0 T5 M0.5/S SC PR**